

CLAIMS

- 1 1. A communications network switch including a plurality of network ports for transmitting
2 and receiving packets to and from network nodes via network links, the switch being operative to
3 communicate with at least one trunking network device via at least one trunk formed by a
4 plurality of aggregated network links, the trunk being coupled with a corresponding trunked port
5 including a subset of the network ports that are coupled with corresponding ones of the
6 aggregated network links of the trunk, the switch comprising:
7 packet buffering means coupled with the network ports, said buffering means for
8 temporarily storing a packet received at a source port, said packet having a source address value,
9 and a destination address value indicating a destination node that is communicatively coupled
10 with said switch via a data path including a trunk;
11 packet routing means coupled to communicate with said buffering means, said routing
12 means for determining a destination trunked port associated with said packet, said destination
13 trunked port including a subset of the network ports, said destination trunked port being coupled
14 to said destination node via said data path; and
15 trunked link load balancing means coupled to communicate with said routing means, said
16 load balancing means for selecting a destination port associated with said packet from said subset
17 of network ports of said destination trunked port;
18 whereby transmission loading of the aggregated network links of said trunk is balanced.
- 1 2. A communications network switch as recited in claim 1 wherein said load balancing
2 means is responsive to a source port ID value indicating said source port, and is operative to
3 select said destination port as a function of said source port ID value.
- 1 3. A communications network switch as recited in claim 1 wherein said load balancing
2 means is responsive to said source address value of said packet, and is operative to select said
3 destination port as a function of said source address value.

1 4. A communications network switch as recited in claim 1 wherein said load balancing
2 means is responsive to said corresponding source and destination address values of said packet,
3 and is operative to select said destination port as a function of said source and destination address
4 values.

1 5. A communications network switch as recited in claim 2 wherein said packet routing
2 means includes a packet routing table which is responsive to said destination address value, and
3 which is operative to provide a trunked port ID value indicating said destination trunked port.

1 6. A communications network switch as recited in claim 5 wherein said load balancing
2 means comprises:

3 a system administration unit providing a plurality of port mapping values, each of said
4 port mapping values being associated with a corresponding one of the network ports, each of said
5 port mapping values including a plurality of port select values, each of said port select values
6 being associated with a corresponding one of a plurality of trunked ports of the switch, each of
7 said trunked ports including a corresponding subset of the network ports, each of said port select
8 values indicating a corresponding selected one of said corresponding subset of network ports of
9 said associated trunked port;

10 a trunk port configuration unit coupled to receive said port mapping values from said
11 system administration unit, and including a plurality of configuration registers for storing
12 corresponding ones of said port mapping values; and

13 an address resolution circuit coupled with said trunk port configuration unit, and
14 including,

15 a first multiplexer having a plurality of inputs for receiving corresponding ones of
16 said port mapping values, a control port responsive to said source port ID value, and an
17 output providing a selected one of said port mapping values in response to said source
18 port ID value being applied to said control port of said first multiplexer,

19 a destination register coupled to said first multiplexer for storing said selected port
20 mapping value, and having a plurality of outputs each providing a corresponding one of
21 said port select values, and

22 a second multiplexer having a plurality of inputs coupled to said outputs of said
23 destination register, a control port responsive to said trunked port ID value, and an output
24 providing a selected one of said port select values in response to said trunked port ID
25 value being applied to said control port of said second multiplexer, said selected port
26 select value indicating said destination port.

1 7. A communications network switch as recited in claim 6 wherein said system
2 administration unit comprises a processing unit and a computer readable memory unit, and
3 wherein said port mapping values are programmable by a user.

1 8. A communications network switch as recited in claim 3 wherein said load balancing
2 means comprises:
3 a register for storing said source address value of said particular packet, said register
4 including at least one register output, each register output providing a port select value derived
5 from said source address value, said port select value for indicating a selected one of a plurality
6 of network ports of a destination trunked port associated with said particular packet.

1 9. A communications network switch as recited in claim 8 further comprising a multiplexer
2 having a plurality of inputs for receiving corresponding one of said port select values, a control
3 port responsive to a predefined bit select value, and an output providing a selected one of said
4 port select values.

1 10. A communications network switch as recited in claim 4 wherein said load balancing
2 means comprises:

3 a first register for storing said source address value of said packet, said first register
4 including at least one output providing a corresponding first value derived from said source
5 address value,

6 a second register for storing said destination address value of said packet, said second
7 register including at least one output providing a second value derived from said destination
8 address value,

9 an exclusive NOR logic unit responsive to said first and second values, and operative to
10 provide a port select value for indicating a selected one of a plurality of network ports of a
11 destination trunked port.

1 11. A communications network switch as recited in claim 1 wherein the trunking network
2 device is a high speed server having a network interface card providing for trunked link
3 communication.

1 12. A communications network switch as recited in claim 1 wherein communication via the
2 network links is implemented in accordance with ETHERNET.

1 13. A communications network switch as recited in claim 1 wherein each of the network
2 links has a bandwidth of 100 Megabits per second, and each of the trunked links provides a
3 bandwidth 400 Mbps

1 14. In a communications network switch having a plurality of network ports for transmitting
2 and receiving packets to and from network nodes via network links, the switch being operative to
3 communicate with at least one trunking network device via a trunk including a plurality of
4 aggregated network links, the trunk being coupled with a corresponding trunked port including a
5 subset of the network ports that are coupled with corresponding ones of the aggregated network
6 links of the trunk, a method for balancing the transmission loading on each of the links of the
7 trunk, the method comprising the steps of:

8 receiving a packet at a source port of the switch, said packet having a source address and
9 a destination address indicating a destination node that is communicatively coupled with the
10 switch via a data path including a trunk;

11 determining a destination trunked port associated with said packet, said destination
12 trunked port including a subset of the network ports, said destination trunked port being coupled
13 to said destination node via said data path; and

14 selecting a destination port associated with said packet from said subset of network ports
15 of said destination trunked port.

1 15. In a communications network switch as recited in claim 14 wherein said step of selecting
2 said destination port includes:

3 receiving a source port ID value indicating said source port; and
4 determining said destination port as a function of said source port ID value.

1 16. In a communications network switch as recited in claim 14 wherein said step of selecting
2 said destination port comprises selecting said destination port as a function of said source address
3 of said packet.

1 17. In a communications network switch as recited in claim 14 wherein said step of selecting
2 said destination port comprises selecting said destination port as a function of said source address
3 and said destination address of said packet.